

THE COMPARATIVE ECONOMIC PERFORMANCE OF CHILE: 1810-1995*

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Abstract

This paper studies the comparative economic record of Chile from immediately after Independence (1820) to the present, as a first step to relate economic policies to that performance in an Economic History to be written. To do the former, three variables were chosen to represent (1) overall behavior (GDP per capita), (2) international performance (exports per capita), and (3) macro-economic discipline (the inflation rate). A sample of 18 countries, to compare Chile's record with was selected, constrained by the availability of information over a long period. These countries were grouped into three categories, "developed" countries, Asia and Latin America. Two methods were used for the analysis: (1) a simple comparison of data averages, whose significance was tested, and (2) discriminant analysis, to obtain overall performance comparisons. The three main conclusions are: (1) Chile's GDP per capita did converge towards that of the more developed countries during last Century and also since the late 1970's, while it diverged between 1940 and 1970; (2) the periods of convergence tend to be related to the adoption of open, market oriented economic policies, while that of divergence was characterized by increasing protectionism and discretionary government intervention; and (3) the break between convergence and divergence did take place somewhere towards the end of the XIXth Century and the beginning of this Century and not as a result of the Great Depression, as held by conventional wisdom.

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Resumen

Este trabajo estudia el desempeño económico comparativo desde inmediatamente después de la Independencia (1820) hasta el presente, como un primer paso para relacionar dicho comportamiento con las políticas económicas en lo que será una Historia Económica aún por escribirse. Para hacer lo primero, se seleccionan 3 variables: (1) desempeño agregado (PGB per cápita), (2) desempeño internacional (Exportaciones per cápita) y (3) disciplina macroeconómica (tasa de inflación). Se relacionó una muestra de 18 países, para compararlas con el desempeño de Chile, sujetos a la disponibilidad de información para ese período tan largo. Se usaron dos métodos para el análisis: (1) una simple comparación de medios, cuya significancia fue testeada y (2) un análisis discriminante para obtener comparaciones del desempeño global. Las tres principales conclusiones son: (1) El PGB per cápita de Chile convergió hacia el de los países más desarrollados durante el siglo pasado y también durante fines de los años setenta, mientras que divergió entre 1940 y 1970; (2) los períodos de convergencia tendieron a estar relacionadas con la adopción de políticas económicas de mayor apertura y de mercado, mientras que los períodos de divergencia estuvieron caracterizados por creciente proteccionismo e intervención discrecional del gobierno y (3) el quiebre entre convergencia y divergencia tuvo lugar en algún momento hacia fines del siglo XIX y el comienzo del presente siglo y no fue el resultado de la Gran Depresión como se sostenía comúnmente.

1. INTRODUCTION

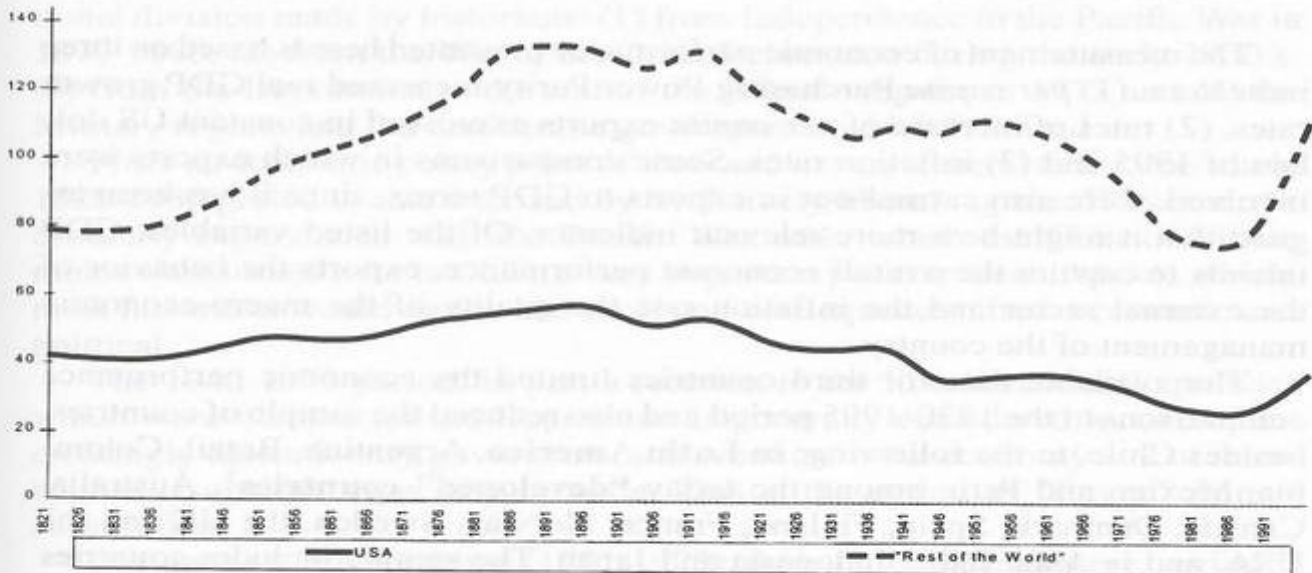
Since the mid 1980's, the economic growth rate of Chile has been very high, exceeding by far the World average, as well as that of Latin America and of the developed countries. That is, the country seems to be on a rapid convergence process towards the income per person levels of the more developed countries. At the same time, exports have been growing very rapidly, inflation rates have gradually come down, to rates around 5 per cent per year, and poverty levels have been falling significantly, although the income distribution has changed very little since 1965. In spite of the latter, the recent Chilean economic performance is generally recognized as very good.

Unfortunately, the same cannot be said about some previous periods and therefore Chile's GDP *per capita*, expressed in current dollars, was in 1995 only 17,3 per cent of that of the USA and, expressed in Purchasing Power Parity terms, only about 37 per cent. Moreover, absolute poverty levels, at about 29 per cent in 1995, are still very high.

It is therefore tempting to find an explanation to Chile's **comparative** economic growth rates, which might perhaps help the country's leaders maintain it on a convergence path. The first step to do the former, is the determination of the historical record, which is the aim of this paper. This required the preparation of a set of data on the Chilean economy, to cover the 1810-1995 period. The year 1810 was chosen, because it is the year of Chile's political independence from Spain. It also required the search for the best possible comparable information for other countries and then the application of a number of statistical tests to determine the validity of the different mean value differences on which the comparison of the economic performance of Chile and that of other countries, is based.

There is, perhaps, no better way to illustrate the results than Graph N° 1, which compares the economic growth rates of Chile with that of the USA and that of the “rest of the countries” in our sample, that is, all 18 countries listed below, except Chile.

GRAPH N° 1
 CHILE'S COMPARATIVE ECONOMIC GROWTH RECORD
 (GDP pc of Chile divided by the GDP pc of the USA and by that of the simple average of the “rest of the World” trends, calculated using the Hodrick-Prescott method)



Taking the 1820-1995 period as a whole, Chile grew at an average annual rate of 1.54 per cent, while the “rest of the World”, the “developed” countries, Asia and Latin America, as represented in the sample, grew at 1.43, 1.55, 1.15 and 1.04 per cent, respectively. Over the same period, to give just a few examples, Japan’s GDP *per capita* multiplied about 28 times, while that of the USA, Chile, Australia, the UK and Mexico multiplied about 16.3, 14.4, 10.3, 9.5 and 6.1 times, respectively. While Chile’s economic performance is not poor if judged solely in terms of growth rates –it does better than Australia and the UK, for example, and only a little worse than the USA– there is certainly no evidence, over the long run, of convergence, like in the case of Japan.

Economic convergence is, however, evident between 1810 and the end of the last, or the beginning of this, Century and since the 1980’s, to the present, while Chile’s economic performance was relatively very poor after World War II. The fact that the breaking point between convergence and divergence took place somewhere around the turn of last Century, runs counter to conventional wisdom.

There is, as will be shown below, a close relationship between the country’s export and inflation performance and the rate of economic growth. Given that the degree of economic liberalization also seems to be directly related to the economic performance, the basic hypothesis of the Economic History to be written, will be that the economic policies applied have definitely determined Chile’s relative growth rates.

The remainder of this paper will, one, describe the method used to measure the relative economic performance of Chile; two, make a summary of the sources of the data used for the exercise; three, present and discuss the main results; five, list the references; and, six, present an Appendix containing data on Chile and a summary of the sources of that data. A complete set of the statistical work and the sources of all the data used is available on a diskette from the editors of this journal and also directly from the author.

2. METHODOLOGY

The measurement of economic performance presented here is based on three indicators: (1) *per capita* Purchasing Power Parity measured real GDP growth rates, (2) rates of increase of *per capita* exports expressed in constant US dollars of 1995 and (3) inflation rates. Some comparisons in which exports were involved, were also carried-out in exports to GDP terms, since it has been argued that it might be a more relevant indicator. Of the listed variables, GDP intends to capture the overall economic performance, exports the behavior of the external sector and the inflation rate the quality of the macro-economic management of the country.

The available data for third countries limited the economic performance comparisons to the 1820-1995 period and also reduced the sample of countries, besides Chile, to the following: in **Latin America**, Argentina, Brazil, Colombia, Mexico and Peru, among the today "**developed**" countries³, Australia, Canada, Denmark, Spain, Finland, France, Norway, Sweden, the UK and the USA, and in **Asia**, India, Indonesia and Japan. The sample includes countries which were already relatively rich in 1820, like the UK, Australia, and the USA, with US\$ 1,880, US\$ 1,726 and US\$ 1,503 *per capita* incomes respectively, versus US\$ 634 in Chile, as well as others which have grown very rapidly, like Japan, which in 1820 had a GDP *per capita* of only US\$ 756, and still others, like Mexico for example, which then already had a per person income level of US\$ 816 and has, on average, grown relatively little since then.

Moreover, the necessary information for the tests is not available for all countries for the whole period and the availability also varies among the three variables here considered. For example, the GDP *per capita* data is available for the whole 1820-1995 period for 14 countries, out of the 18 of the sample besides Chile, while at the other extreme, the export *per capita* data is only available for the same period for 4 countries. Being interested in significant differences in economic performance between Chile and the rest of the World, the problem was "solved" by including in the comparisons always all the available information. Graph N° A-1, in the Appendix, illustrates the problem in the case of the GDP variable and Graph N° A-2, also in the Appendix, illustrates this problem for exports. They also make it evident that the advantages of a "richer" sample, which is to make the comparisons more relevant at present, can be achieved at a reasonable cost in terms of distortions when moving from

³ Japan is not included here, but it is among the Asian countries.

a smaller to a larger number of countries. Note that the work is done with simple averages, which means that the size of a country does not influence sample averages. Therefore, for example, the fact that the USA is one of the countries for which data is available from 1820 onwards, does not explain why, in the case of Graph N° A-1, average GDP *per capita* levels do not vary that much as the number of countries is enlarged. The explanation lies, of course, to a large extent, in the workings of the "law of large numbers".

To be able to relate, in the Economic History, different economic policies to economic performance, the comparisons made here not only cover the 1820-1995 period, but also some sub-periods. Those chosen roughly follow the traditional division made by historians: (1) from Independence to the Pacific War in 1879-1880, (2) from the War to the Great Depression during the early 1930's, (3) from the Depression to the end of the Allende regime in 1973 and (4) the Military regime and the democratic governments which followed it.

From an economic policy point of view and in very general terms, the whole 1820-1930 period is characterized by a relatively liberal regime. However, the economy experienced with the Pacific War, after which the Chilean Nitrate mines were turned over to Chile, a very important positive wealth shock, which, most historians would agree, had profound consequences, both economic and political.

The 1940-1973 period, in part a reaction to the liberal economic policies which were blamed for the Depression is generally considered as one of increasingly discretionary government intervention in the economy and of international isolation, especially in trade. This is the period of "forced" import substitution.

During the Allende regime (1971-1973), these latter policies were carried to an extreme and the economy became practically centralized, within a very unstable socio-political climate.

The following Military regime (1973-1990), reacted and liberalized the economy, including international trade and finance. These policies were, if anything, deepened during the democratic regimes, which came to power in 1990 and 1995.

For statistical comparison purposes, the disturbances due to the Pacific War, the Great Depression and its aftermath, and during the Allende regime and its aftermath, were eliminated. That is, comparisons are made for 1820-1995; 1820-1879; 1880-1929; 1940-1970; and 1978-1995.

To evaluate the relative economic performance of Chile during each one of these periods, two methods are used: the first, is a separate and simple comparison of averages for each one of the three selected variables, in Chile and in the "rest of the World" and the second, is a global evaluation, comparing the simultaneous performance of the three variables, GDP *per capita*, exports *per capita* and inflation rate in Chile, with the same in the "rest of the World". In the case of the former, differences in mean values are tested to determine their statistical significance and to do the latter, discriminant analysis is used⁴.

⁴ For a technical description of discriminant analysis see Hair, Joseph, Anderson, R., Tatham, R. and Black W. (1995) and Marija, Norusis (1993).

Discriminant analysis is, simplifying, a tool which, in this case, defines a statistical relationship –a line, a plane, etc.– for the set of data belonging to each one of the countries of the sample, or groupings of countries, of interest and then, classifies all the data as being “closer” to one or the other country or group of countries. As an example, take the case of two variables only, GDP and exports and two countries, Chile and the USA. A regression line between the two variables is computed for each country, Chile and the USA, each regression line characterizing the behavior of those two countries in terms of GDP and exports. Thereafter, discriminant analysis classifies all the data provided as belonging either to Chile or to the USA, “forgetting” that the data really belongs to one or the other country’s experience. This is done on the basis of the “proximity” of a given point –defined by GDP and exports in a given year for a given country– to the regression line which “describes” one or the other country. In the case of two countries with very different mean values for GDP and exports and in which the data has very little dispersion, perhaps none of the data for one country will be classified as belonging to the other country. However, if the mean values are not too different and the data is highly dispersed, the opposite might be happening⁵. In general, if as a result of applying discriminant analysis, over 50 per cent of the data for one country is classified by the analysis as belonging to the same country, it is judged to have a “different” behavior from the other, or other, countries.

In summary, mean value and discriminant analysis, applied to a sample of 18 countries distributed among Asian, Latinamerican and “developed” countries, besides Chile, over the 1820-1995 period and also over sub-periods classified according to Chilean conventional wisdom, will allow us, using three variables –GDP, exports and inflation– to judge the relative historic economic performance of Chile. The data and statistical tools permit us also to confirm or reject conventional wisdom as far as the different sub-periods in our Economic History are concerned. Of course, the results will, as always, depend heavily on the quality of the data.

3. THE DATA

A complete description of the data used in this analysis can be found in Braun et al. (1998). The main series are, of course, those for GDP, exports, inflation and population in Chile and for the other 18 countries of the sample. Most of the data for the foreign countries has been taken from Maddison (1995), although there are important exceptions. For example, for the Export Quantum the information for the Latin American economies is from ECLA and that for Spain is from Carreras (1989).

⁵ To reduce the dispersion of the data and make the comparisons more meaningful for the ultimate purpose at hand –to relate economic policies to economic performance trends– the data for the discriminant analysis was taken from five years moving averages of the original information.

The data for Chile, in summary, has been prepared using the following sources:

Population

The population series was prepared on the basis of the information reported in Maddison (1995), which calculates the population at mid-year. The data of Maddison (1995) for the 1950-1995 period is coherent with that of INECELADE (1995) and was used because Maddison is also the source of information for the other countries of the sample. Information for the missing years before 1950, where only Census data was available, was interpolated using a polynomial, to avoid the sharp changes in trends at the Census years, which happens in the case of linear interpolations.

Gross Domestic Product

This data is reported in millions of pesos of 1995 and the series was constructed using the following information and method:

- 1995-1985: BCENCH (1998), GDP series in millions of 1986 pesos. The GDP deflator was used to obtain the series in millions of 1995 pesos. Thereafter and until 1817, real Product *changes* were used to link the new information to the 1985-1995 series.
- 1985-1974: changes in the GDP series, expressed in millions of pesos of 1977, reported in BCENCH(1990).
- 1974-1960: changes in the GDP series, expressed in millions of pesos of 1977, reported in BCENCH(1989).
- 1960-1940: changes in the GDP series, expressed in millions of pesos of 1960, reported in Trivelli. and Trivelli (1978). This series is a corrected version of the official National Accounts.
- 1940-1860: changes in an aggregated Value Added Production Index which considers the agricultural, mining, industrial and public sectors. The weighting of the different sectors, for the purposes of obtaining the Index, was based on sectoral production values estimated at 1908-1910 average prices and estimated sectoral value added coefficients (see Diaz, Lüders and Wagner (1998b).
- 1860-1833: GDP changes estimated on the basis of the regression coefficients of the following equation, run for 1860-1910: $\Delta Y = 0,023789 + 0,07772 \cdot \Delta FE + 0,146789 \cdot \Delta QX$, where $Y = \ln \text{GDP (Millions of 1995 pesos)}$, $FE = \ln \text{Fiscal Expenditures (Millions of 1995 pesos)}$, $QX = \ln \text{Exports Quantum (Millions of 1995 pesos)}$.
- 1833-1817: GDP changes estimated on the basis of the regression coefficients of the following equation, run for 1833-1860: $\Delta Y = 0,000669 +$

$0,072294 \cdot \Delta FI + 0,114604 \cdot \Delta QX$, where $Y = \ln$ GDP (Millions of 1995 pesos), $FI = \ln$ Fiscal Income (Millions of 1995 pesos), and $QX = \ln$ Exports Quantum (Millions of 1995 pesos).

1810: the GDP level was estimated using the coefficients of the regression equation estimated above on the basis of the 1833-1860 information, but the data for Fiscal Expenditures, instead of that for Fiscal Income, was used, because of doubts about the quality of the Fiscal Income data for 1810. Since there is no information on Fiscal Income or Expenditures available between 1810 and 1817, if there was a need for GDP data during those years, an estimate was obtained using a simple interpolation.

Exports

The comparisons in the text are based on quantum indices. These are indirectly obtained by estimating an export value series and an export price index. Both series are expressed as indices with a common base and the Export Value Index is divided by the Export Price Index, to obtain the Export Quantum Index.

Export Values

This series is expressed in millions of current US\$ and was generated using the following method:

- 1995-1988: information from the Monthly Bulletin of the Central Bank (August 1966).
- 1987-1960: data obtained directly from BCENCH(1989), pages 350 and following.
- 1959-1949: Central Bank, Balance of Payments of 1960
- 1948-1944: Central Bank, Balance of Payments of 1958
- 1943-1931: Central Bank, Balance of Payments 1958, page 84. This publication reports the export values as registered by the Superintendency of Customs. Since these latter values are not exactly equal to the values reported by the Balance of Payments prepared by the Central Bank for the 1944-1995 period, the former were adjusted by 0,991954262 for the 1943-1931 period.
- 1930-1926: Estadística Chilena (Santiago), Year III, N° 12 (December 1930), page 553. Since the information was expressed in pesos of 6 British pennies, it was transformed into current dollars by multiplying by 0,12166.
- 1925-1862: Statistical Yearbook of 1925 (1927). Since the information was expressed in pesos of 6 British pennies, it was transformed into current dollars by multiplying by 0,12166.
- 1861-1844: Data obtained from Ibáñez (1912). Since the information was expressed in current pesos, it was transformed into current dollars using the exchange rate of D'Ottone and Cortés (1965).

1843-1841: A linear interpolation was made between the information for 1944, from Ibáñez(1912) and that from Rector(1985), see below.

1840-1810: Data obtained from Rector(1985). Since the information was expressed in current pesos, it was transformed into current dollars using the exchange rate of D'Ottone and Cortés (1965) between 1833 and 1840 and assuming that the exchange rate between 1810 and 1833 did not vary, not too strong an assumption since the country was on a metallic standard.

Export Price Index

The following method was used to obtain this series:

1995-1980: BCENCH (1989b), page 7; BCENCH (1991), page 40; BCENCH (1995), page 40; and BMBC, Vol. 69, N° 822 (August 1996), page 2163.

1980-1970: Unit Value Series of ECLA(1987), page 191.

1970-1960: Unit Value Series of ECLA(1976), page 39.

1960-1928: Central Bank, Balance of Payments of 1960(1962), pages 20 and 22, Unit Value Series of the Superintendency of Customs of Chile.

1928-1900: ECLA(1951), Table 2A.

1900-1861: Clavel(1990), Unit Value Series.

1860-1844: Changes in the Export Price Index in Palma(1979), appendix 18.

1844-1810: Changes in the Lima Price Index, in Gootenberg(1989).

Consumer Price Index

The following method was used to prepare this series:

1995-1979: Central Bank, Monthly Bulletin (several numbers).

1978-1970: Changes of the corrected official index in Schmidt-Hebbel and Marshall(1981).

1969-1928: Changes in the CPI taken from the Central Bank's Monthly Bulletin (several numbers).

1927-1926: Changes in the CPI of the Dirección de Estadísticas y Censos.

1925-1830: Changes in Wagner's (1992, page 132, Table IP-5) General Price Index (1908-9-10=100)

1829-1810: Changes in a polynomial cutting across the values of a quinquennial Price Index of Riveros (1987), calculated on the basis of 1803-1833 data. The equation is: $CPI(t) = 4,63 + 0,17 * t - 0,077 * t^2 + 0,011 * t^3 - 0,0007 * t^4 + 2,073E-05 * t^5 - 2,198E-07 * t^6$

4. THE RESULTS

The results will be presented and discussed here on a period and sub-period basis. Within each period the information on period averages will be presented first, followed by the results of the discriminant analysis, to close with a discussion of the results.

1820-1995, Independent Chile

Chile became independent from Spain in 1810⁶. However, a period of institutional instability followed until the late 1920's. Starting in the 1930's, Chile became, under a liberal democracy, one of the most politically stable and peaceful countries in Latin America. This does not mean that it has not lived through exceptional periods: wars with Spain in 1865 and Bolivia and Peru in 1879-1883, the latter associated with a significant positive wealth shock; an internal revolution in 1891 and military takeovers in 1924, 1927-32 and 1973-1990. It has also experienced some mayor recessions or depressions: in 1874 (GDP dropped by 5.6 per cent *per capita*), 1883-85 (-4 per cent), 1914-1915 (-20 per cent), 1926-27 (-12 per cent), 1930-1932 (-47 per cent) and 1982-1983 (-19 per cent). As mentioned above, during its independent history, Chile has adopted different economic models, which, in very general terms, can be defined as **Liberal** (1810-1929), **Forced Import Substitution** (1940-1970) and a **Social Market Economy** (1974 onwards). The changes in economic model took place in relatively short periods of time and can be associated with crisis periods: the Great Depression during the 1930's and the Allende regime, during the early 1970's. The comparative growth record of the whole 1820-1995 period can be described in the following way:

Period averages

Table N° 1 summarizes the overall comparative results over the 1820-1995 period, in terms of rates of growth of GDP *per capita*, exports *per capita*, and prices (inflation).

⁶ In this and the following sections institutional aspects of Chile's General and Economic History are summarized. For references see: Bulmer-Thomas (1994), Cariola and Sunkel (1990), Corbo, V.; Lüders, R. and Spiller, P. (1997), Ffrench-Davis (1972); Millar (1994); Lüders (1968), and Meller (1996)

TABLE N° 1
1820-1995: COMPARATIVE ECONOMIC PERFORMANCE INDICATORS
(Simple average rates of growth for periods and groupings)

Countries	GDP p.c.	Exports p.c.	Prices
Chile	1.54	2.5	19.2
"Rest of the World"	1.43	2.8	23.8
"Developed" countries	1.55	2.8	3.4
Asia	1.15	n.a.	40.8
Latin American	1.04	n.a.	72.3

Discriminant analysis

Table N° 2 presents the overall results over the 1820-1995 period of the discriminant analysis, Chile against the "rest of the World".

TABLE N° 2
1820-1995: DISCRIMINANT ANALYSIS
(Rates of change of five years moving averages of GDP p.c., exports p.c. and prices)

Chile and other countries in the sample		Chile and the average of the "rest of the World"	
% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile	% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile
Chile (4.7)	Brazil (23.3)	Chile (42.1)	Other countries (15.2)
USA (17.5)	Peru (10.3)		
India (11.1)	Mexico (8.6)		
Australia, Colombia (10.5)	Argentina (5.1)		
Mexico (9.9)	Japan (0.9)		
UK (7.6)	France (0.6)		
Data Correctly classified: 13.97%		Data Correctly Classified: 63.45%	
The Chilean behavior is not different		The Chilean behavior is not different	

Discussion

As mentioned above, the statistical analysis shows that Chile's economic performance since Independence is not very different from that of the "rest of the World". This is confirmed both, on the basis of average growth rates of GDP *per capita*, exports *per capita* and prices, whose small differences between Chile and the "rest of the World" are nevertheless statistically significant, and on the basis of discriminant analysis, whose results, although showing a low 13.97 per cent of correctly classified data, probably cannot be replicated by chance, as tested by Press's Q. If exports *per capita* are replaced by the export to GDP ratio, the *conclusions* do not change, nor do they in the cases discussed in the next paragraphs.

When comparing the performance of Chile only with that of the "developed" countries, the average growth rate again is very similar, although the export growth rates *per capita* of the latter are about 10 per cent higher and the macro-economic discipline seems to have been very superior. However, the results of the discriminant analysis, which, in spite of the fact that only about 18 per cent of the data was correctly classified, also could probably not be replicated with random data, confirm that the overall performance of Chile, as compared to the "developed" countries, has not been different. In fact, only 25.7 per cent of the Chilean data was classified as such.

The Asian countries in the sample, in spite that Japan is included, have done much worse than Chile. Their average growth rates, confirmed by statistical tests, have been significantly lower and their average inflation rates have been significantly higher. This weaker performance is confirmed by the discriminant analysis, which shows that over 55 per cent of the data is correctly classified and that 65.5 per cent of the data of Chile is classified as such. These percentages rise to 74 and 70 per cent, respectively, if Chile is compared with the average rates of the three countries in the sample.

The case of Chile compared with Latin America falls in between. Latin America shows the lowest overall average economic growth rate and the highest inflation rate, which are significantly different from the Chilean rates. However, the discriminant analysis, if Chilean behavior is compared with that of the rest of the Latin American countries in the sample, shows that it is not different. This is coherent with the fact that in the comparison of Chile with the "rest of the World", the data of the other countries classified as Chile included Brazil (23.3 per cent), Peru (10.3 per cent), Mexico (8.6) and Argentina (5.1 per cent). The only other country that appeared in the list was Japan, with 0.9 per cent. In the comparison mentioned at the beginning of this paragraph, only about 26.3 per cent of the Chilean data is classified as such. Although the correctly classified data is a low 26.2 per cent, the Press's Q test indicates that the results could probably not originate by chance.

However, if, using discriminant analysis, Chile's data is compared with that of Latin American regional averages based on the countries included in the sample, the *conclusions* change⁷ and Chile's behavior appears as different, a

⁷ This happens because the dispersion of the data tends to diminish if country averages are used.

result more in line with what one would expect from the simple averages presented in Table N° 1. In this case, the percentage of correctly classified data increases to almost 54 per cent and over 70 per cent of Chile's data is correctly classified⁸.

Finally, it might be argued that all these results are a reflection of the base period used, since Chile's GDP *per capita* actually fell as a consequence of Independence and the socio-political turmoil associated with it. In fact, none of the statistical conclusions change if the base is 1830, a year in which GDP *per capita* was approaching pre-Independence levels. The lowest *per capita* levels were reached in 1824.

In summary, overall, Chile's economic performance does not appear to be different over the 1820-1995 period to that of the "rest of the World" and to that of the "developed countries. This result is quite strong from a statistical point of view. Chile does perform better than Asia and Latin America, although the latter is a statistically weak *conclusion*. These results are, however, not satisfactory if one judges the economic performance from a normative point of view, because they suggest the absence of any convergence. Chile's GDP was in 1820 only about one third of that of the developed countries and one might have expected that the country would grow faster than the richer economies, as in fact happened during the first sub-period to be analyzed next.

1820-1878, The Liberal economy, phase I

This is a period which begun with Independence and ended just before the Pacific War, against Bolivia and Peru. Free enterprise and a bi-metallic (silver, gold) monetary standard prevailed and the State was basically concerned with the strengthening of Nationhood and in particular, with matters related to defense, order and justice, especially the former. Strong conservative governments, especially between 1830 and 1860, tended to generate fiscal surpluses and political stability. After Independence, trade was freed and custom duties were imposed only for fiscal purposes. Economic activities were centered around agriculture, where a semi-feudal system inherited from the Colonial period existed, and around export mining, especially copper and silver. A significant growth of artisan activities to supply the agriculture and mining needs took place, especially during the latter part of the period. The political stability and economic prosperity attracted a significant number of foreign intellectuals and artists, especially from other Latinamerican countries, transforming Chile into one of the cultural centers of the region.

Period averages

Table N° 3 summarizes the overall comparative results over the 1820-1878 period, in terms of rates of growth of GDP *per capita*, exports *per capita*, and prices (inflation).

⁸ What happens when the country data is averaged for a number of countries is that the dispersion of the information is reduced, which makes it more likely to find differences in behavior. That is, a difference found in a test between individual countries is stronger than one found between one country and the average of the rest of the countries.

TABLE N° 3
1820-1878: COMPARATIVE ECONOMIC PERFORMANCE INDICATORS
(Simple average rates of growth for periods and groupings)

Countries	GDP p.c.	Exports p.c.	Prices
Chile	1.39	3.0	- 0.2
"Rest of the World"	0.85	3.1	0.4
"Developed" countries	0.95	3.0	0.1
Asia	0.14	n.a.	1.3
Latin American	0.10	n.a.	n.a.

Discriminant analysis

Table N° 4 presents the overall results over the 1820-1878 period of the discriminant analysis, Chile against the "rest of the World".

TABLE N° 4
1820-1878: DISCRIMINANT ANALYSIS
(Rates of change of five years moving averages of GDP p.c., exports p.c. and prices)

Chile and other countries in the sample		Chile and the average of the "rest of the World"	
% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile	% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile
Chile (25.9)	Spain (5.6)	Chile (77.8)	Other countries (7.4)
UKA (20.4)	France (1.9)		
Spain (18.5)			
Australia (13.0)		Other countries (22.2)	
USA (7.4)			
Finland (5.6)			
Data Correctly classified: 41.50%		Data Correctly Classified: 85.19%	
The Chilean behavior is not different		The Chilean behavior is different	

Discussion

During the 1820-1878 period, Chile (1.39 per cent) grew faster than the today "developed" countries (0.95 per cent) and also than the average growth rates of all the other countries, grouped as has been done for this analysis. The difference is statistically significant. In fact, of all the 15 countries for which information is available for this period, only Australia (1.82) enjoyed a faster rate of economic growth. During this period, the UK, the USA, Japan and Mexico grew at 1.19, 1.10, 0.18 and 0.10 per cent, respectively.

It is not possible to make such a strong statement as above if one judges the overall relative economic performance of Chile, as reported by the discriminant analysis, which considers, besides economic growth, exports and inflation. In a comparison of Chile against all the other countries with information, taken independently, its behavior turns out to be not statistically different from the "rest of the World". Although 41.5 per cent of the data is classified correctly, only 25.9 per cent of the Chilean data classifies as such. The explanation probably lies in the fact that the data on export performance is scarce and the inflation rates were very low almost everywhere. However, if one compares Chile with the average of the other countries, Chile's economic behavior does become statistically different, which probably means superior, since its average growth rate was higher and its average inflation rate was lower⁹.

If Chile's overall economic behavior is compared with the "developed" countries, the results are very similar to the above, but the distinction becomes stronger. Moreover, the comparison with Asia definitely suggests that Chile's behavior is different¹⁰. In the comparison with individual countries, over 69 per cent of the data is correctly classified and of the data of Chile, almost 89 per cent is classified as such. Evidently, if Chile is compared with the averages of the Asian countries, these numbers increase, to 97 and 94 per cent, respectively. There is not enough information about the countries from Latin America to apply discriminant analysis to them alone during this period.

In summary, during 1820-1878 Chile did grow faster than the "developed" countries and the "rest of the World" and there is some statistical evidence that its overall economic behavior, as measured here, was significantly superior. At the end of this sub-period, Chile entered into the Pacific War and became, as a consequence of the territorial occupation, the owner of the rich formerly Bolivian and Peruvian Chilean Nitrate reserves. This had an important impact on economic conditions during the following sub-period.

⁹ Even this latter case is weak, since when, instead of using the export p.c. ratio, exports/GDP rate is used, again the Chilean economic behavior turns out not to be statistically different from the "rest of the World".

¹⁰ The Press's Q test does not reject the hypothesis that the results obtained for the Chile-Asia overall comparison could be the result of a random process.

1880-1929, The Liberal economy, phase II

Although the Pacific War lasted until 1883, after 1879 it was fought to the north of Lima, the capital of Peru, well into Peruvian territory. As a consequence, economic conditions in Chile normalized very rapidly after 1879. At the same time the Presidential system, adopted with the Constitution of 1833, weakened and, after the revolution of 1911, became *de facto* a Parliamentary regime. In 1925, responding to the desire to have stronger governments, a new Constitution was written, re-establishing the Presidential system.

The Chilean State privatized the Chilean Nitrate mines, formerly in Bolivian and Peruvian territory, and imposed an export tax of about one third of sales. Since exports expanded very rapidly, the governments were able to reduce other taxes significantly and still expand fiscal expenditures fast. Rent seeking was probably an unavoidable consequence of this new State wealth and governments also expanded State Owned Enterprises in the financial and public utilities, including railroads. The rapid growth of Chilean Nitrate exports generated "Dutch Disease" and had therefore a negative impact on other tradable activities, especially other mining exports and agriculture, but also, to some extent, industry. The affected tradable sectors demanded and sometimes received, custom and other forms of protection.

Migration from agriculture to the cities, especially in Valparaíso and Santiago, but also to the north, took place. Trade and to some extent, industry, to support Chilean Nitrate mining, were flourishing, and a new upper class, which was adopting the living style of their European counterparts, especially the French, came into existence. This contrasted with the living conditions of the working class, especially in the mining towns and in the industrial neighborhoods of the cities, where housing, health and working conditions were bad. Convertibility had been suspended in 1878, at the wake of the Pacific War, and was not resumed, except for a brief period during 1895-98, until 1925, when the Central Bank was created. The existence of a fiduciary system permitted the development of inflation, which turned out to be more difficult to bear for the poor. All these conditions led towards the end of the Century to the so called "Social Question" and later, during the 1920's, to relatively liberal laws and regulations providing Social Security benefits and significant negotiation power to workers and worker unions, respectively.

Moreover, Chile received the benefits of the drastic and universal reduction in transportation costs that started in the 1870's, as well as those from the globalization of trade and finance made possible by the general adoption of the Gold Standard during the last part of the XIXth Century and the first decade of this one. However, Chile was heavily impacted by World War I and its aftermath. During this period, Chilean Nitrate exports and prices fluctuated widely and Chile experienced the deepest drop in fiscal revenues, ever. It also paid the costs of the competitive devaluations which took place after the War.

It is against this background that the relative economic performance of the 1880-1929 period will be measured.

Period averages

Table N° 5 summarizes the overall comparative results over the 1880-1929 period, in terms of rates of growth of GDP *per capita*, exports *per capita*, and prices (inflation). Data for the 1880-1933 period is also shown, to determine if conventional wisdom is correct when it asserts that the break in Chile's convergence process took place during the Great Depression.

TABLE N° 5
1880-1929: COMPARATIVE ECONOMIC PERFORMANCE INDICATORS
(Simple average rates of growth for periods and groupings)

Countries	GDP p.c.		Exports p.c.		Prices	
	1880-1913	1880-1929	1880-1913	1880-1929	1880-1913	1880-1929
Chile	1.8	1.5	3.2	2.7	4.4	4.6
"Rest of the World"	1.3	1.2	2.0	1.7	2.7	3.7
"Developed" countries	1.5	1.4	2.0	1.8	0.3	2.5
Asia	1.0	1.1	7.3	6.5	3.1	3.4
Latin American	1.6	1.4	3.6	3.6	11.1	8.0

Discriminant analysis

Table N° 6 presents the overall results over the 1880-1929 period of the discriminant analysis, Chile against the "rest of the World". The behavior during the 1880-1913 period was also tested, to determine if conventional wisdom is correct when it asserts that the break in Chile's convergence process took place during the Great Depression.

Discussion

During this period, Chile (1.5 per cent) still did well in terms of growth, if compared to the "developed" countries (1.4 per cent)¹¹. The same is true if compared to other groupings, as can be seen in Table N° 5. However, a number of countries in the sample do better than Chile, some of them very significantly, like Canada (2.65) and Argentina (2.16). During this period, the Scandinavian countries grow, in general, faster than Chile. The USA (1.59) does slightly better and the UK (0.80) and Australia (0.21), the "stars" of the past, much worse. Moreover, if growth rates of 1880-1929 with those of 1880-1913 are compared, it can be inferred that it is generally true that growth rates fell for all countries after 1913, due to World War I and its consequences, but this drop is much

¹¹ Unless explicitly indicated otherwise, the differences in the averages reported are statistically significant.

TABLE N° 6
1880-1929: DISCRIMINANT ANALYSIS

(Rates of change of five years moving averages of GDP p.c., exports p.c. and prices)

Chile and other countries in the sample		Chile and the average of the "rest of the World"	
% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile	% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile
Chile (8.9)	Peru (8.3)	Chile (51.1)	Other countries (17.8)
Spain, Mexico (22.2)	Japan (4.4)		
Peru (13.3)	Australia, Denmark, Norway, Sweden (2.2)		
Norway (8.9)		Other countries (48.9)	
Japan (6.7)			
Argentina, Australia (4.4)			
Data Correctly classified: 21.71%		Data Correctly Classified: 66.67%	
The Chilean behavior is not different		The Chilean behavior is different	

sharper in Chile than in the groupings made for comparison purposes. That is, the conventional wisdom that Chile's relative decline began after the Great Depression does not seem to hold and the process really starts earlier, as judged from Graph 1, probably already towards the end of the XIXth Century.

It is true that Chile's export growth record (2,7 per cent) was very good during this period, if compared, for example, to that of the "developed" countries (1.8 per cent). After all the country had just acquired the Chilean Nitrate mines, among other things, a virtual monopoly of the production of nitrogen, an essential element in the production of gun powder. However, the countries grouped under Latin America (3.6 per cent) and Asia (Japan (6.5 per cent)) did better. In addition, although Chile's average rate of inflation over the 1880-1929 period (4.6 per cent), was not high by recent standards, it exceeded that of all the other groupings made in this study, except for Latin America (8.0 per cent).

If an overall comparative evaluation is made, using discriminant analysis, it is possible to find a weak indication that Chile's economic behavior is differ-

ent, presumably better, than that of the rest of the countries in the sample. In fact, if Chile is compared with the other countries individually, only 21.7 per cent of the data is classified correctly, although the Press's Q test indicates that this result probably cannot be replicated using random data, and only 8.9 per cent of the data of Chile is classified as such. However, if Chile's data is compared with averages for all the other countries in the sample, Chile's behavior is statistically different, the above percentages being respectively, 66.7 and 51.1. Moreover, if the former test, that is, Chile against all other countries individually, is applied to the 1880-1913 period, the respective percentages are 34.0 and 44.8, the latter relatively close to the 50 per cent necessary to judge that Chile's behavior is different.

Moreover, discriminant analysis indicates that Chile's economic behavior was different from that of the "developed" countries: strongly so, during 1880-1913, and weakly, during 1880-1929. As mentioned, Chile had faster GDP and export growth, although higher inflation rates. Similar results apply to Asia¹² and Latin America. All these results reinforce the previous finding, that Chile's economic behavior deteriorated after 1913, if not before.

In summary, the 1880-1929 period is still one in which, on average, a convergence process of Chile's GDP to the levels of the "developed" countries, took place. However, comparing the growth rates of 1880-1913 with those of 1880-1929—the former are significantly higher—suggests that the convergence process ended in 1913 or even before.

1940-1970, Forced Import Substitution

Chile is one of the countries that suffered most from the Great Depression: exports fell by 79% per cent and GDP *per capita* by 47%.

The Depression experience, no doubt, but also factors like Keynesianism, the rapid growth rates of more centralized economies in Europe, like the German one, and internal political conditions, led to the election of the Popular Front, which included Communists, Socialists and especially members of other center and left-leaning parties. Their platform included a much more active role of the government in the economy than in the past, including the promotion of industrial infrastructure State Owned Enterprises in energy, chemicals and steel; the establishment of an industrial policy; a key role of the State in the provision of Social Services; etc. Moreover, industry had to be protected, at least temporarily, from foreign competition and this was done by raising customs, imposing import quotas and having multiple exchange rates, among other means. Cheap credit had to be made available, especially to industrial firms, to allow them to carry-out the necessary investments. Chile had abandoned convertibility during the early 1930's, which gave the Central Bank, if authorized by law, freedom to issue money to finance those credits, as it often did.

The War had interrupted the normal flow of goods to Chile and made the Popular Front policies almost seem "natural". However, after World War II, when a good number of countries, especially in Europe and Asia, liberalized

¹² The Press's Q test does not reject the hypothesis that the Asian numbers could be the result of a random process.

their economies and also their trade and, eventually, their financial flows, Chile did not do it. Although the absolute economic growth rate between 1940 and 1958 was about the same as, for example, that of the USA, the population was not satisfied with that record and a period of experiments begun¹³. The first was the conservative government of Jorge Alessandri, who implemented a large public works program, liberalized trade somewhat and implemented an un-orthodox anti-inflationary program, which failed. The second was the reformist government of Eduardo Frei, who implemented several reforms, including an agrarian, a trade and a tax reform, "chileanized"¹⁴ the large foreign owned copper companies, and implemented a sophisticated anti-inflationary program, which also failed, basically because of lack of the necessary fiscal discipline and excessive wage increase pressures. The last one was, of course, the Popular Unity's Allende government, which was elected with 34 per cent of the vote in 1970, with the support of the Socialists and Communists. Allende tried to implement a revolutionary platform against the will of the majority of the Chileans, which led to the Military takeover of 1973. The 1940-1970 period is therefore characterized by an increasing intervention of the governments in the economy and its comparative record will be analyzed next.

Period averages

Table N° 7 summarizes the overall comparative results over the 1940-1970 period, in terms of rates of growth of GDP *per capita*, exports *per capita*, and prices (inflation). Data for the 1946-1970 period is added to illustrate the effect of the import substitution policies *per se*.

TABLE N° 7
1940-1970: COMPARATIVE ECONOMIC PERFORMANCE INDICATORS
(Simple average rates of growth for periods and groupings)

Countries	GDP p.c.		Exports p.c.		Prices	
	1940-1970	1946-1970	1940-1970	1946-1970	1940-1970	1946-1970
Chile	1.5	1.4	-0.4	-0.8	27.3	30.4
"Rest of the World"	2.6	3.1	3.3	5.3	21.2	23.6
"Developed" countries	2.8	3.3	5.6	6.6	6.7	5.9
Asia	1.7	4.4	6.0	25.4	163.9	188.5
Latin American	2.2	2.5	0.2	0.1	14.9	15.9

¹³ High and relatively unpredictable inflation rates might have contributed significantly to this insatisfaction.

¹⁴ By financing new investments to increase production and thereby acquiring 51 per cent of the property of the mines.

Discriminant analysis

Table N° 8 presents the overall results over the 1940-1970 period of the discriminant analysis, Chile against the "rest of the World". Chile's comparative economic behavior during 1946-1970 was also tested, to illustrate the effect of the import substitution policies *per se*.

TABLE N° 8
1940-1970: DISCRIMINANT ANALYSIS
(Rates of change of five years moving averages of GDP p.c., exports p.c. and prices)

Chile and other countries in the sample		Chile and the average of the "rest of the World"	
% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile	% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile
Chile (69.2)	Argentina (30.8)	Chile (96.2)	Other countries (11.5)
Argentina (15.4)	Mexico (11.5)		
Peru (7.7)	Brasil (7.7)		
Norway (8.9)	Peru (3.8)		
Colombia, Mexico (3.8)			
Data Correctly classified: 41,18%		Data Correctly Classified: 92,31%	
The Chilean behavior is different		The Chilean behavior is different	

Discussion

During the 1940-1970 period, but even more so during 1946-1970, that is after World War II, the **comparative** growth experience of Chile was dismal. During the latter period, while Chile was growing at a 1.4 per cent average rate, the "rest of the World" was doing it at more than double that rate, 3.1 per cent. The "developed" countries were doing even better, at 3.3 per cent, and Asia was topping all of them, at 4.4 per cent. Even Latin America was growing at a respectable 2.5 per cent rate. After the War, Japan grew at 8.3 per cent, the European countries in general were growing at rates exceeding 3 per cent, as was Brazil in Latin America. The USA and the UK grew at 2.01 and 2.14 per cent, respectively.

In general, growth was driven by recovery and international trade. Chile, not having participated directly in the War and having closed its economy to trade flows, like most of Latin America, did not take part in that growth. After World War II the average annual rate of growth of exports *per capita* in Japan was 25.4 per cent, while in Chile it was a negative 0.8 per cent rate. Latin American trade *per capita* had also stagnated, as a result of forced import substitution policies, but even the "developed" countries had an annual exports *per capita* growth rate of 6.6 per cent between 1946 and 1970. Countries like France (11.9 per cent), Finland (8.8 per cent), Spain (8.5 per cent), Norway (8.1 per cent) and Denmark (8.0 per cent) experienced very rapid rates of growth of exports *per capita* and GDP.

This is also a period of weak macro-economic management in Chile and Latin America in general. Chile's rate of inflation during these periods almost doubled that of the rest of Latin America and was about five times as high as that of the "developed" countries.

Given the above, it is not surprising to find that the overall test of Chile's economic performance provided by discriminant analysis this time indicates strongly that the countries behavior is different from the "rest of the World", both for 1940-1970 and 1946-1970. Different means here, quite clearly, worse. In fact, the results are, as expected, stronger for the latter period, since they have a higher percentage of well classified data (49 vs 41 per cent) and also more Chilean data classified as itself (80 vs 69 per cent). This suggests evidently that Chile performed worse, relative to the "rest of the World", after the War, when it maintained its protectionist and interventionist policies, while many countries, especially in Europe and also Asia, liberalized their economies. The use of exports/GDP, instead of exports *per capita*, does not change the statistical results.

These conclusions are even stronger in the case of the "developed" countries, where the test shows, for both periods here analyzed, that 100 per cent of the Chilean data classifies as such. In the case of Asia something similar happens, but not quite as strong. Even in the case of Latin America, probably because of Chile's poorer growth and inflation experience, Chile's behavior is statistically clearly different from that of the regional countries in the sample. Chile's data classifies as Chile in 69 per cent of the cases during 1940-1970 and 80 per cent of the cases after World War II.

In summary, 1940-1970, but especially the period after World War II, is a time in which Chile's growth rate was significantly lower than that of the average of the "developed" countries of the sample and that of the average of other regions included in the study. The data suggests that the maintenance of forced import substitution policies, after the rest of the world opened up to trade, might explain a large part of that deficiency. The relatively low growth rates and also the relatively high inflation rates, certainly contributed to the political conditions which led, first, to the Allende government and then, to the Military take-over, which liberalized the economy.

1978-1995, The Social Market Economy

The Military decided early that, to re-establish a viable democracy, one necessary condition was an economy which would be able to grow rapidly un-

der price stability. Since during the last period several economic schemes were tried and none of those seemed to have worked, they turned to a group of young economists, trained in the USA, who were in favor of a radical change in favor of liberalization, against most technical growth expert advice of the time. They led an economic reform program to liberalize the economy, to impose strict fiscal discipline and to impose rules over authorities, as a way to end with the destructive rent seeking which had characterized the Chilean economy since the Pacific War. The private sector was to become the engine of growth and governments were to play a subsidiary role. Prices, interest rates and wage rates were freed, custom duties and other protectionist devices were drastically reduced, State Owned Enterprises were privatized, government provision of social services was partially replaced by subsidies to the demand and private production of such services, foreign capital received practically the same treatment as local capital, the fiscal deficit was turned into a surplus, eventually the Central Bank was made independent, etc., etc. In summary, the institutions of a modern market economy were put into place.

The process is not complete, it is not difficult to find places where the created institutions can be improved and the experiment run, at times, into severe difficulties. Examples of the latter can be found during 1975, when it was affected by a balance of payments crisis and 1981-83, when it was hit by the debt crisis. However, the Military were able to overcome those problems and in 1990 handed over power to a Democratic government, followed by another one led by the same center-left coalition. These governments have maintained the same basic model and lowered trade barriers further, freed capital flows somewhat more and continued the process of privatization, specially in the area of public works, through BOT (Buy, Operate and Transfer) type of arrangements. They have also made an additional effort to provide social services to the needy and to equalize opportunities for all citizen. That is, if anything, these governments have deepened the process, although at a relatively slow pace.

Period averages

Table N° 9 summarizes the overall comparative results over the 1978-1995 period, in terms of rates of growth of GDP *per capita*, exports *per capita*, and prices (inflation).

TABLE N° 9
1978-1995: COMPARATIVE ECONOMIC PERFORMANCE INDICATORS
(Simple average rates of growth for periods and groupings)

Countries	GDP p.c.	Exports p.c.	Prices
Chile	3.2	6.8	20.6
"Rest of the World"	1.5	4.4	115.4
"Developed" countries	1.6	4.8	6.5
Asia	3.0	3.4	5.2
Latin American	0.2	2.6	399.7

Discriminant analysis

Table Nº 10 presents the overall results over the 1978-1995 period of the discriminant analysis, Chile against the "rest of the World".

TABLE Nº 10
1978-1995: DISCRIMINANT ANALYSIS
(Rates of change of five years moving averages of GDP p.c., exports p.c. and prices)

Chile and other countries in the sample		Chile and the average of the "rest of the World"	
% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile	% of the data of Chile classified as the indicated countries	% of the data of other countries classified as Chile
Chile (92.3)	Mexico (7.7)	Chile (92.3)	Other countries (7.7)
Colombia (7.7)		Other countries (7.7)	
Data Correctly classified: 65.59%		Data Correctly Classified: 92.31%	
The Chilean behavior is different		The Chilean behavior is different	

Discussion

During this period, Chile's GDP *per capita* (3.2) grew much faster than that of the "developed" countries (1.6 per cent), signaling an evident convergence process. It also grew much faster than the "rest of the World" (1.5 per cent) and Latin America (0.2 per cent). Only the Asian countries in the sample grew at about the same rate (3.0 per cent). Of all the countries in the sample, only Indonesia grew faster (3.7 per cent). The UK and the USA grew at 1.59 and 1.34 per cent, respectively.

Chile's growth was evidently export driven. Over this period its exports *per capita* grew at 6.8 per cent, against 4.8 per cent of those of the "developed" countries, 3.4 per cent in the Asian sample and 2.6 per cent for Latin America. Countries which experienced fast export per person growth rates during this period include Spain (8.42 per cent) and Norway (6.36 per cent). These same exports of the USA increased at an annual average rate of 4.43 per cent.

The average inflation record (20.6 per cent) is not that good, however it has to be considered that by 1978 the inflation rate in Chile was still relatively high (37.2 per cent), having come down from over 500 per cent during 1973, the last year of the Allende regime. During 1997 the inflation rate was 6 per cent. In any event, during the period as a whole, the "developed" countries had much lower average inflation rates (6.5 per cent) and the Asian countries in the sample were doing even better (5.2 per cent).

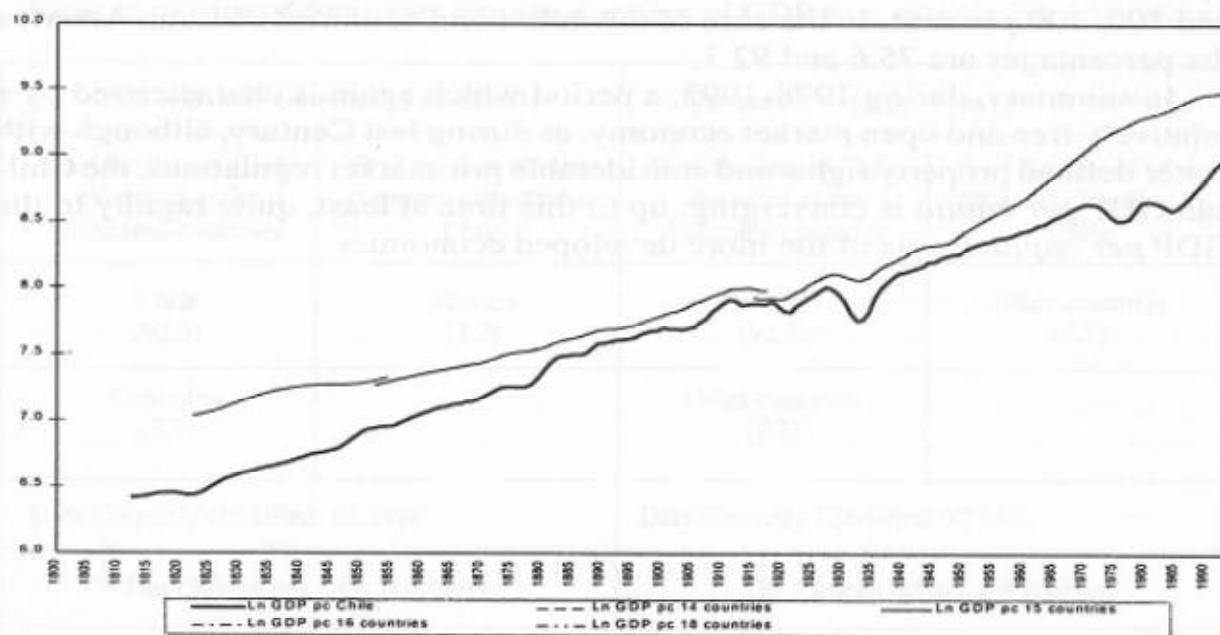
The discriminant analysis, of course, reflects the data just described and finds that Chile's economic behavior is different from the other countries in the sample. In this case, different means better, although it also reflects the worse inflation record. In the case of the individual countries of the "rest of the World", the percentage of correctly classified data is almost 66 per cent and the Chilean data classified as such is over 92 per cent. In the cases of the individual "developed" and Asian countries of the sample, the respective percentages are 61, 100 and 100, 100 per cent. In the case of the individual countries of Latin America the percentages are 75.6 and 92.3.

In summary, during 1978-1995, a period which again is characterized by a relatively free and open market economy, as during last Century, although with better defined property rights and considerable pro-market regulations, the Chilean *GDP per capita* is converging, up to this time at least, quite rapidly to the *GDP per capita* levels of the more developed economies.

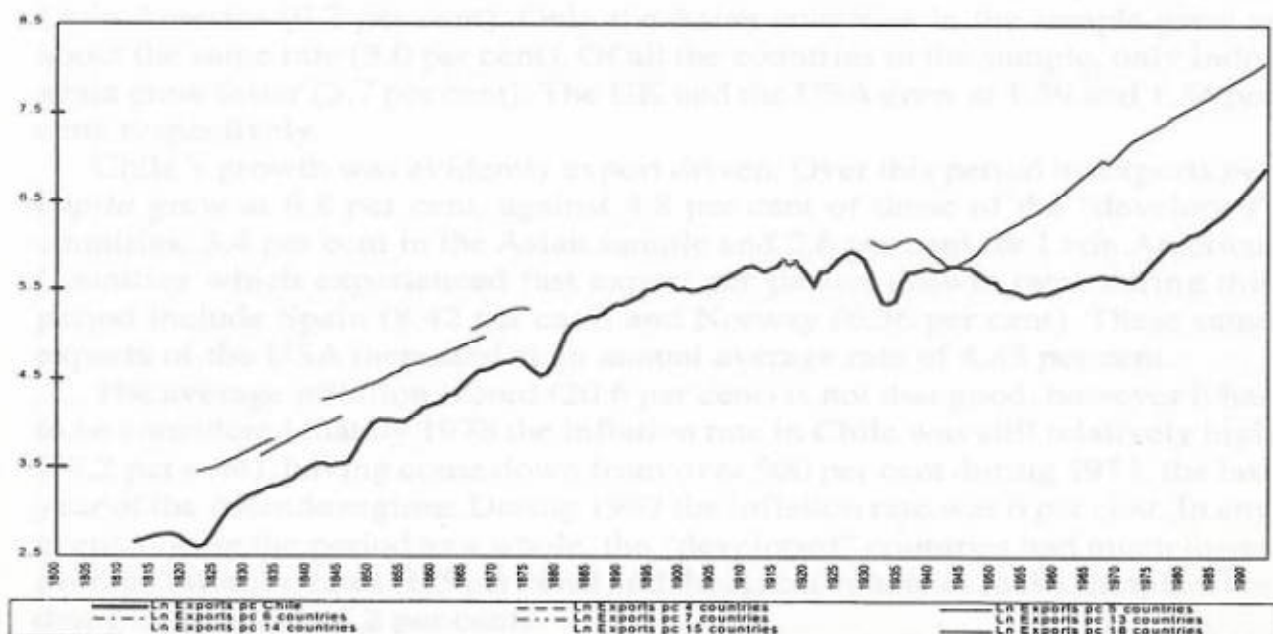


APPENDIX

GRAPH A-1
 GDP PC OF CHILE COMPARED WITH THE SIMPLE AVERAGE
 OF THE GDP PC OF THE "REST OF THE WORLD"
 (5 years moving averages)



GRAPH A-2
 EXPORTS PC OF CHILE COMPARED WITH THE SIMPLE AVERAGE
 OF THE EXPORTS PC OF THE "REST OF THE WORLD"
 (5 years moving averages)



DATA

The following is the information for Chile used in this study:

	Exports fob (million US\$ 1995)	GDP (PPP 1990, (million US\$ 1995)	Population (thousands mid years)	Inflation (%)
1800			625	
1801			636	
1802			647	
1803			658	
1804			670	
1805			682	
1806			694	
1807			706	
1808			718	
1809			731	
1810	10	548	744	
1811	10	550	757	2.13
1812	11	552	770	4.46
1813	11	555	784	6.24
1814	12	557	798	7.28
1815	12	560	812	7.51
1816	13	562	826	6.94
1817	13	564	840	5.70
1818	13	574	855	3.97
1819	13	562	870	1.95
1820	14	574	885	-0.13
1821	12	561	900	-2.07
1822	11	577	915	-3.68
1823	12	588	930	-4.82
1824	13	587	946	-5.40
1825	17	619	962	-5.36
1826	19	637	978	-4.72
1827	21	655	995	-3.57
1828	22	664	1,011	-2.09
1829	24	683	1,028	-0.61
1830	24	687	1,045	0.41
1831	26	701	1,063	-0.18
1832	28	725	1,081	-5.16
1833	27	738	1,099	-2.19
1834	30	769	1,117	-0.23
1835	31	802	1,135	-4.76
1836	32	813	1,154	12.64
1837	33	848	1,173	-0.72
1838	35	869	1,192	2.91

	Exports fob (million US\$ 1995)	GDP (PPP 1990, (million US\$ 1995)	Population (thousands mid years)	Inflation (%)
1839	37	887	1,212	5.44
1840	45	951	1,231	-1.14
1841	44	970	1,251	-5.28
1842	45	1,000	1,272	-9.48
1843	44	1,038	1,292	-9.84
1844	42	1,061	1,313	4.56
1845	43	1,100	1,334	2.22
1846	49	1,145	1,355	3.44
1847	50	1,178	1,377	7.69
1848	53	1,235	1,399	-16.64
1849	73	1,331	1,421	-8.48
1850	87	1,409	1,443	1.35
1851	85	1,457	1,465	-1.81
1852	92	1,511	1,487	3.59
1853	74	1,487	1,510	18.48
1854	76	1,540	1,533	5.73
1855	93	1,621	1,556	4.00
1856	88	1,651	1,580	0.18
1857	96	1,715	1,604	3.73
1858	101	1,802	1,628	-12.51
1859	108	1,873	1,653	2.57
1860	132	1,948	1,678	9.82
1861	108	1,960	1,703	-3.40
1862	117	1,965	1,728	5.27
1863	126	2,052	1,754	2.17
1864	158	2,174	1,780	-5.57
1865	155	2,261	1,806	-3.90
1866	168	2,323	1,833	-1.56
1867	178	2,244	1,860	1.55
1868	192	2,369	1,887	-0.04
1869	220	2,621	1,915	-1.71
1870	177	2,691	1,943	-0.49
1871	200	2,698	1,974	5.60
1872	235	2,902	2,004	6.52
1873	230	3,095	2,036	4.47
1874	251	2,967	2,068	-2.14
1875	218	3,213	2,101	0.07
1876	197	3,179	2,134	2.25
1877	178	3,077	2,167	5.47
1878	189	3,264	2,201	-5.09
1879	226	3,761	2,236	6.40
1880	274	4,226	2,271	10.78
1881	335	4,374	2,307	-0.85

	Exports fob (million US\$ 1995)	GDP (PPP 1990, (million US\$ 1995)	Population (thousands mid years)	Inflation (%)
1882	418	4,739	2,343	-10.59
1883	469	4,768	2,380	2.10
1884	427	4,811	2,417	0.15
1885	389	4,667	2,455	15.37
1886	421	4,864	2,493	0.58
1887	510	5,205	2,532	-2.61
1888	513	4,999	2,571	-0.16
1889	527	5,128	2,611	-1.85
1890	577	5,500	2,651	7.16
1891	579	5,949	2,684	30.49
1892	555	5,830	2,717	-4.77
1893	637	6,120	2,750	21.95
1894	663	6,019	2,783	11.39
1895	726	6,442	2,815	-25.05
1896	815	6,478	2,847	-5.64
1897	643	6,335	2,879	3.80
1898	815	7,102	2,911	12.16
1899	767	7,147	2,943	7.76
1900	743	6,964	2,974	-1.40
1901	657	7,138	3,011	0.66
1902	744	7,450	3,048	5.47
1903	755	7,031	3,086	-7.25
1904	811	7,607	3,124	4.45
1905	900	7,599	3,163	5.27
1906	779	8,193	3,202	9.07
1907	822	8,626	3,242	15.28
1908	1,056	9,542	3,282	29.18
1909	1,036	9,590	3,323	-3.81
1910	1,125	10,675	3,364	2.30
1911	1,033	10,386	3,406	0.56
1912	1,125	10,799	3,448	7.62
1913	1,197	10,996	3,491	11.04
1914	909	9,292	3,537	8.38
1915	999	8,993	3,584	16.27
1916	1,289	11,024	3,631	-5.05
1917	1,379	11,262	3,679	1.85
1918	1,744	11,405	3,728	-1.42
1919	642	9,785	3,777	22.69
1920	1,293	11,053	3,827	14.57
1921	823	9,580	3,877	-1.71
1922	929	9,931	3,928	4.12
1923	1,328	11,961	3,980	2.29
1924	1,531	12,863	4,033	4.63

	Exports fob (million US\$ 1995)	GDP (PPP 1990, (million US\$ 1995)	Population (thousands mid years)	Inflation (%)
1925	1,429	13,423	4,086	7.71
1926	1,369	12,305	4,140	-4.55
1927	1,516	12,082	4,195	1.22
1928	1,797	14,800	4,250	0.45
1929	1,874	15,574	4,306	7.40
1930	1,229	13,080	4,370	-5.18
1931	1,048	10,305	4,434	0.00
1932	504	8,707	4,500	23.64
1933	775	10,730	4,567	4.42
1934	1,237	12,953	4,634	4.23
1935	1,259	13,699	4,703	-1.36
1936	1,306	14,372	4,773	12.34
1937	1,714	16,341	4,843	9.76
1938	1,580	16,529	4,915	2.22
1939	1,441	16,876	5,003	7.61
1940	1,489	17,552	5,093	9.10
1941	1,656	17,577	5,184	23.14
1942	1,692	18,154	5,277	25.52
1943	1,620	18,708	5,371	7.83
1944	1,783	19,196	5,467	15.00
1945	1,886	20,672	5,565	7.71
1946	1,815	22,445	5,665	30.08
1947	1,643	20,030	5,767	23.08
1948	1,820	23,369	5,870	16.82
1949	1,428	22,722	5,975	20.60
1950	1,628	23,979	6,082	16.51
1951	1,602	25,019	6,215	23.39
1952	1,698	26,628	6,351	12.02
1953	1,309	28,637	6,489	56.17
1954	1,524	27,713	6,631	71.10
1955	1,706	28,740	6,776	83.81
1956	1,580	29,239	6,936	37.70
1957	1,610	32,233	7,100	17.24
1958	1,626	34,004	7,267	32.51
1959	1,888	32,211	7,438	33.24
1960	1,877	34,749	7,614	5.47
1961	1,994	36,411	7,798	9.61
1962	2,081	38,136	7,986	27.69
1963	2,095	40,549	8,179	45.34
1964	2,351	41,451	8,377	38.47
1965	2,430	41,786	8,579	25.82
1966	2,553	46,446	8,757	16.96
1967	2,506	47,954	8,938	21.89

	Exports fob (million US\$ 1995)	GDP (PPP 1990, (million US\$ 1995)	Population (thousands mid years)	Inflation (%)
1968	2,558	49,670	9,123	27.94
1969	2,819	51,519	9,311	29.34
1970	2,484	52,578	9,504	36.10
1971	2,795	57,286	9,680	28.21
1972	2,487	56,591	9,853	255.18
1973	2,544	53,442	10,023	606.10
1974	3,082	53,963	10,189	369.20
1975	3,317	46,996	10,350	343.32
1976	4,282	48,649	10,508	199.33
1977	4,202	53,446	10,661	84.14
1978	4,006	57,838	10,815	37.18
1979	4,960	62,627	10,975	38.90
1980	5,057	67,603	11,145	31.24
1981	4,761	71,803	11,325	9.54
1982	5,507	62,046	11,515	20.73
1983	5,803	60,308	11,713	23.09
1984	5,793	63,857	11,916	23.04
1985	6,551	65,114	12,121	26.42
1986	7,053	68,758	12,329	17.36
1987	7,655	73,292	12,538	21.45
1988	8,033	78,651	12,748	12.68
1989	8,830	86,956	12,961	21.41
1990	9,741	90,172	13,173	27.33
1991	10,702	97,358	13,360	18.66
1992	12,493	109,312	13,550	12.70
1993	12,894	116,949	13,743	12.23
1994	14,377	123,624	13,939	8.95
1995	16,039	136,763	14,137	8.20

TESTS

A complete set of data and tables, and the statistical tests performed for this study, can be obtained on a diskette from the editor of this journal and/or directly from the author.

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